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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,045	10/31/2003	Takashi Kuroi	244521US-2 DIV	8375

22850 7590 03/26/2004

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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POMPEY, RON EVERETT

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 03/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/697,045

Applicant(s)

KUROI ET AL.

Examiner

Ron E Pompey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☒ Certified copies of the priority documents have been received in Application No. 09/401,849.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10-31-03
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 10 - 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inumiya et al. (US 6,54,355) in further view of Chau et al. (5,434,093).

Inumiya discloses the limitations of:

a) forming a structure (108, fig. 9D) on a main surface of a substrate in an area in which a gate electrode is formed later;

(b) forming source/drain regions (112, fig. 9E) in said main surface of said substrate in an area in which said structure is not formed;

(c) forming a first insulating film (113, fig. 9F) on said main surface of said substrate in an area in which said structure is not formed;

(d) after said step (c), removing said structure (fig. 9F); and

(f) forming a gate insulating film (116, fig. 9H) composed of a third insulating film on said main surface of said substrate in an area in which said first insulating film and said sidewalls are not formed (col. 15, ln. 30 – col. 16, ln. 43).

Inumiya does not disclose the claimed limitation(s) of:

(e) forming a second insulating film on the construction obtained by said step (d) and etching said second insulating film by an anisotropic etching whose etching rate is

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higher in depth direction of said substrate to form sidewalls on sides of said first insulating film; and

g) forming said gate electrode to fill an inversely tapered recessed part formed by sides of said sidewalls and an upper surface of said gate insulating film.

However,

a. Chau discloses the above claimed limitations regarding:

forming a sidewalls on sides of said first insulating film and fill an inversely tapered recessed part, formed by sides of said sidewalls, and an upper surface of said gate insulating film with a gate material (fig. 2d – 2f) in column(s) 9, line(s) 7 - column(s) 10, line(s) 55.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Chau with Inumiya, because the inverted spacer allows for forming narrow length transistors in a better and cheaper way than current photolithographic technology.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

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Applicant claims that step (d) comprises the steps of; (d-1) between said step (c) and said step (e), removing said second film with said first film left unremoved, and (d-2) between said step (e) and said step (f), removing said first film by a wet etching. However, the second film is not formed until step (e), therefore you cannot remove a layer that is not formed initially.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ron E Pompey whose telephone number is (571) 272-1680. The examiner can normally be reached on flex schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (571) 272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ron Pompey  
Art Unit: 2812  
March 20, 2004

  
John F. Niebling  
Supervisory Patent Examiner  
Technology Center 2800